

**VULGUS  
CONVERSION KIT  
INSTRUCTION  
MANUAL**

**SNK Electronics Corporation**  The SNK logo features the letters "SNK" in a bold, italicized, sans-serif font. The "S" and "N" are connected by a horizontal stroke, and the "K" has a vertical stroke extending downwards.

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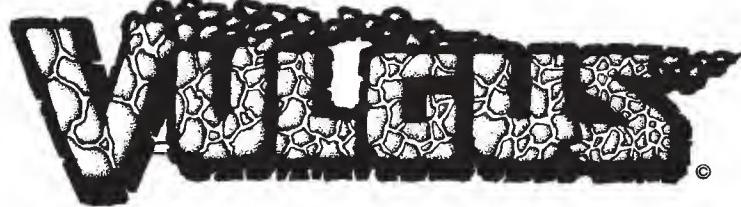


## CONVERSION KIT CONTENTS:

- 1 - MAIN PRINTED CIRCUIT BOARD**
- 1 - P.C. BOARD CAGE (FCC REQUIRED)**
- 1 - CONNECTING WIRING HARNESS**
- 1 - 8-WAY JOYSTICK**
- 4 - FIRE BUTTONS**
- 1 - MARQUEE**
- 1 - MONITOR BEZEL OVERLAY**
- 1 - CONTROL PANEL OVERLAY**
- 1 - PLEX CONTROL COVER**
- 2 - SIDE STICKERS**
- 1 - PLAY INSTRUCTION & FUNCTION LABELS**
- 1 - TECHNICAL SERVICE MANUAL**

Note: Replacement Accessories Available Through Your Distributor...OR

**SNK ELECTRONICS CORP.**



## TO THE TECHNICIAN

### INTRODUCTION

This instruction manual has been specifically designed for your use. It will provide you with adequate information to convert your old game as simply as possible.

Contained herein are schematic diagrams for working with our printed circuit board. For better

understanding, a Main Block Diagram and a Sound Board Block Diagram are supplied. Everything that you will need to construct your new game is provided in this kit, as listed on the preceding contents page.

## CAUTION

### F. C. C. REGULATION COMPLIANCE

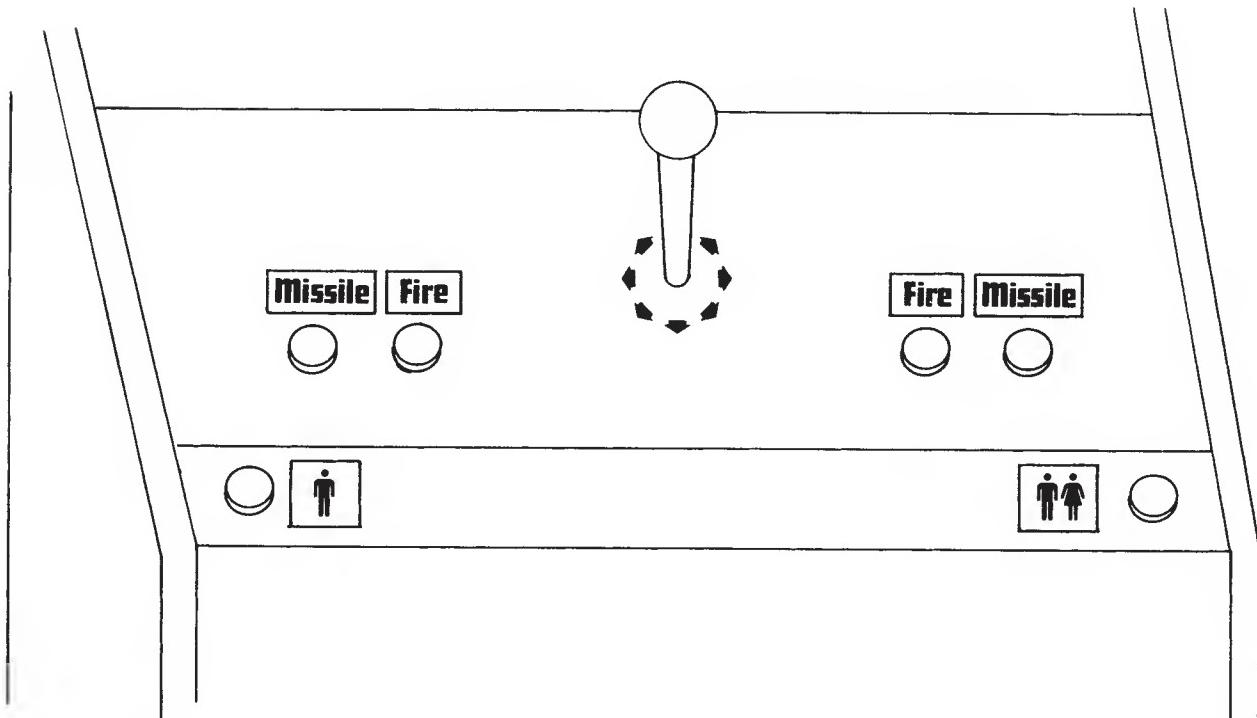
THE P.C. BOARD CAGE SUPPLIED WITH THIS CONVERSION KIT MUST BE UTILIZED AND TERMINATED TO GROUND AT THE TIME OF INSTALLATION.

THIS IS TO AVOID RADIO FREQUENCY RADIATION AND COMPLY WITH THE LIMITS FOR A CLASS "A" COMPUTING DEVICE PURSUANT TO SUB-PART "J" OF PART 15 OF F.C.C. RULES, WHICH ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST SUCH INTERFERENCE WHEN OPERATED IN A COMMERCIAL ENVIRONMENT.

OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA IS LIKELY TO CAUSE INTERFERENCE - IN WHICH CASE, THE USER AT HIS OWN EXPENSE, WILL BE REQUIRED TO TAKE WHATEVER MEASURES MAY BE REQUIRED TO CORRECT THE INTERFERENCE.

## CONTROL PANEL LAYOUT

**THE EIGHT WAY JOYSTICK SHOULD BE  
CENTERED ON THE CONTROL PANEL AND THE  
FIRE AND MISSILE BUTTONS PLACED AS  
SHOWN BELOW:**



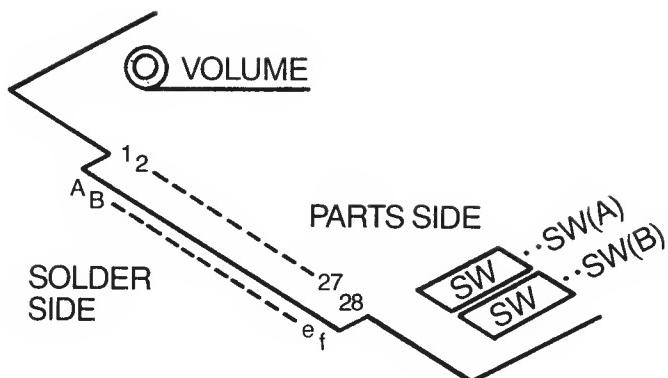
## SW (A)

	CONTENTS	GAME DIP SW							
		1	2	3	4	5	6	7	8
GAME CHARGE (COIN-1)	1 COIN / 1 CREDIT	OFF	OFF	OFF					
	1 " / 2 "	ON	OFF	OFF					
	1 " / 3 "	OFF	ON	OFF					
	2 " / 1 "	ON	ON	OFF					
	3 " / 1 "	OFF	OFF	ON					
	4 " / 1 "	ON	OFF	ON					
	5 " / 1 "	OFF	ON	ON					
	FREE PLAY	ON	ON	ON					
GAME CHARGE (COIN-2)	1 COIN / 1 CREDIT			OFF	OFF	OFF			
	1 " / 2 "			ON	OFF	OFF			
	1 " / 3 "			OFF	ON	OFF			
	2 " / 1 "			ON	ON	OFF			
	3 " / 2 "			OFF	OFF	ON			
	4 " / 3 "			ON	OFF	ON			
	5 " / 4 "			OFF	ON	ON			
	FREE PLAY			ON	ON	ON			
NR. OF PLAYERS	3 AIR-PLANE						OFF	OFF	
	1 "						ON	OFF	
	2 "						OFF	ON	
	5 "						ON	ON	

## SW (B)

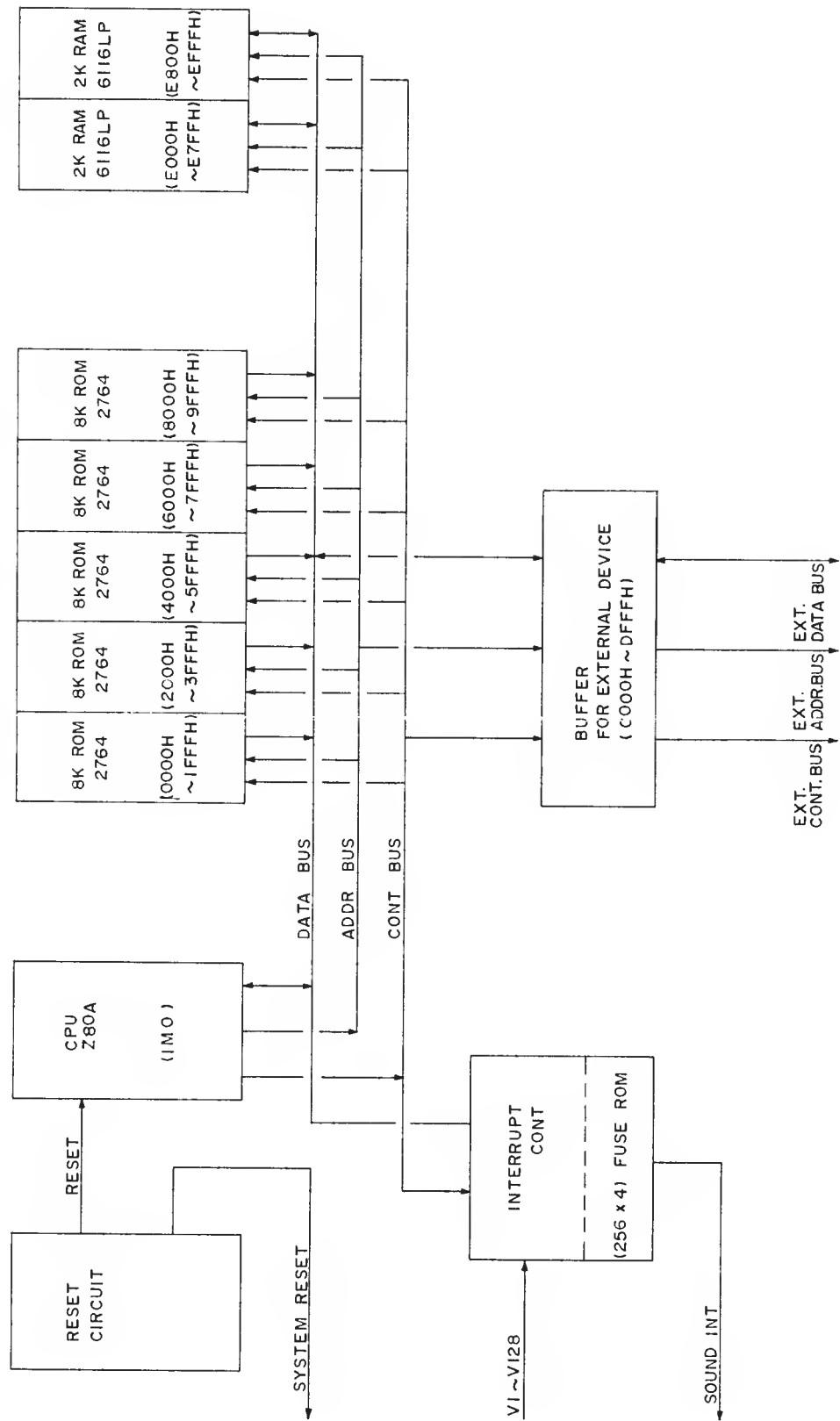
	CONTENTS	GAME DIP SW							
		1	2	3	4	5	6	7	8
BONUS POINTS	TABLE TYPE	OFF							
	UP-RIGHT TYPE	ON							
	1st 20,000      2nd 60,000		OFF	OFF	OFF				
	" 10,000      " 50,000		ON	OFF	OFF				
	" 10,000      " 60,000		OFF	ON	OFF				
	" 10,000      " 70,000		ON	ON	OFF				
	" 20,000      " 70,000		OFF	OFF	ON				
	" 20,000      " 80,000		ON	OFF	ON				
DEMO SOUND	" 30,000      " 70,000		OFF	ON	ON				
			ON	ON	ON				
	DEMO WITH SOUND ON					OFF			
	DEMO WITH SOUND OFF					ON			
DEMO MUSIC	DEMO WITH MUSIC ON						OFF		
	DEMO WITH MUSIC OFF						ON		

# CONNECTOR

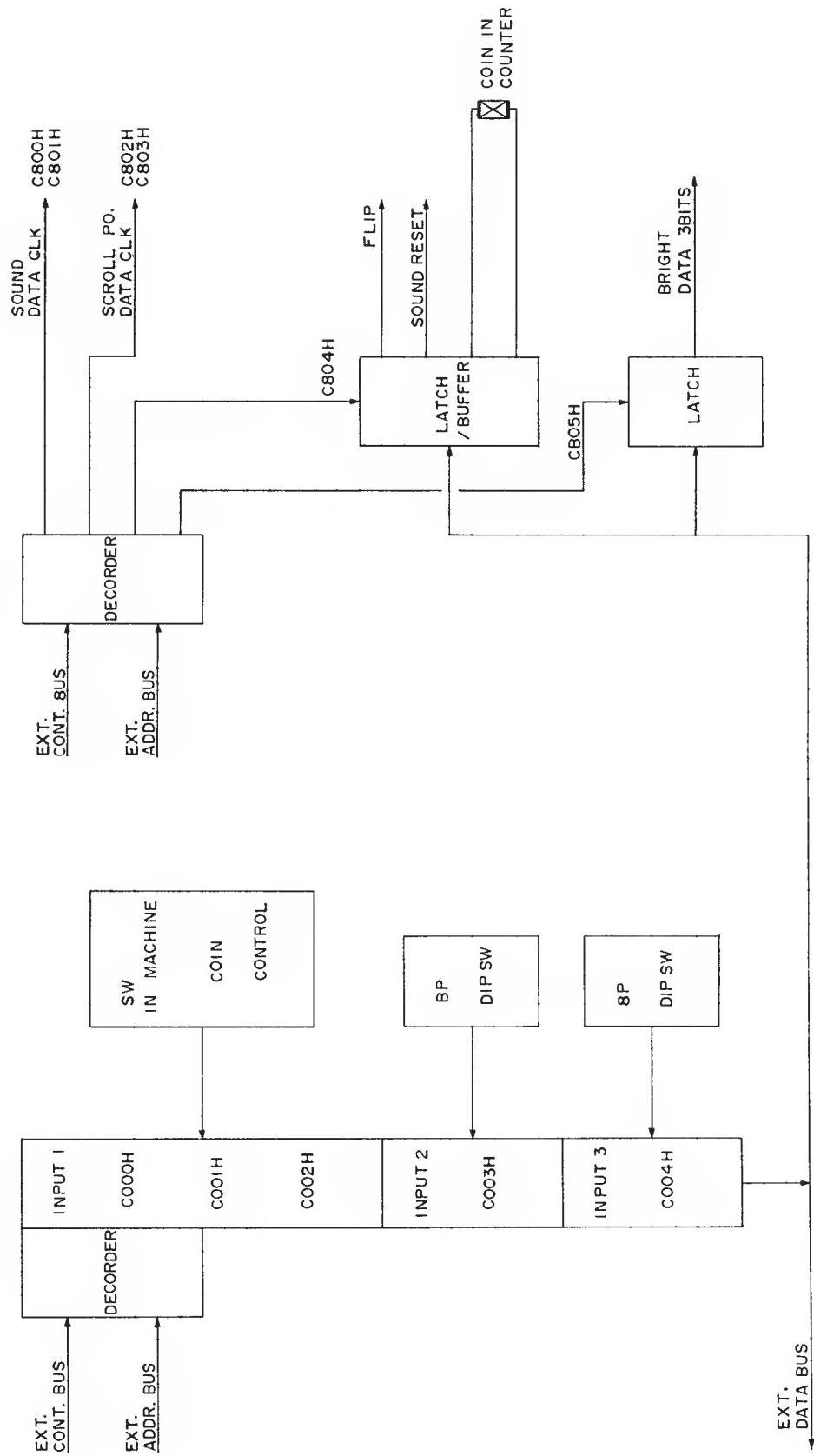


GND	A	1	GND	
+5V	B	2	+5V	
+12V	C	3	+12V	
GND (12V)	D	4	GND (12V)	
SPEAKER $\ominus$	E	5	SPEAKER $\ominus$	
SPEAKER $\oplus$	F	6	SPEAKER $\oplus$	
COIN COUNTER $\ominus$	H	7	COIN COUNTER $\oplus$	
<hr/>				
J		8	<hr/>	
1P {		SHOOT	K	
DOWN SW		L	UP SW	
RIGHT SW		M	LEFT SW	
SHOOT SW		N	(GND)	
DOWN SW		P	1P	
RIGHT SW		R	2P	
2P SW		S	{	
1P SW		T	1P	
COIN SW (1)		U	2P	
COIN SW (2) (SERVICE SW)		V	{	
VIDEO SIGNAL		W	1P	
VIDEO (GREEN) OUTPUT		X	CANNON	
VIDEO (RED) OUTPUT		Y	2P	
VIDEO GND		Z	CANNON	
+5V		a	VIDEO (RED) OUTPUT	
GND		b	VIDEO (GREEN) OUTPUT	
+5V		c		
GND		d		
+5V		e		
GND		f		

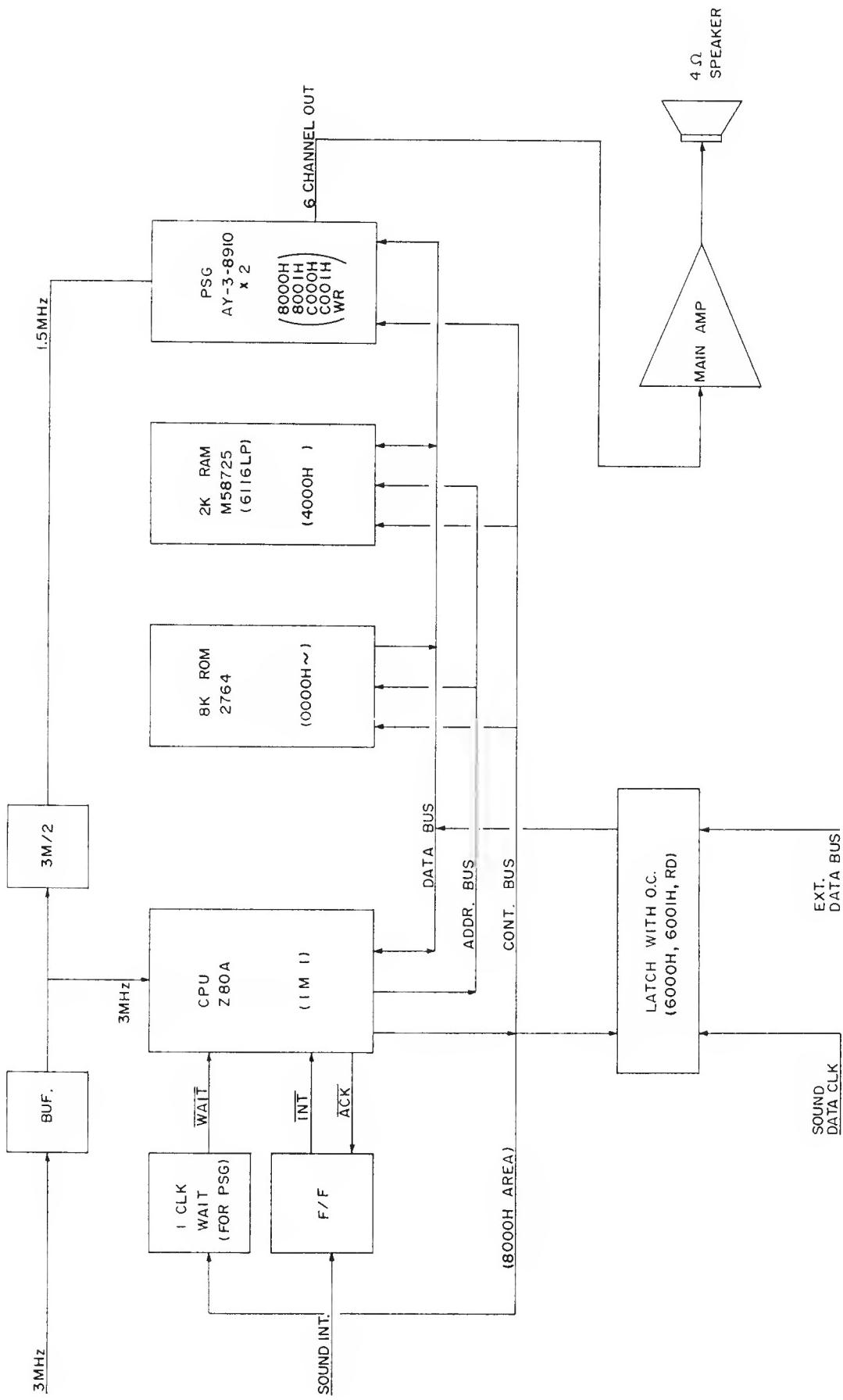
# CPU (Z80A) MAIN CONTROL



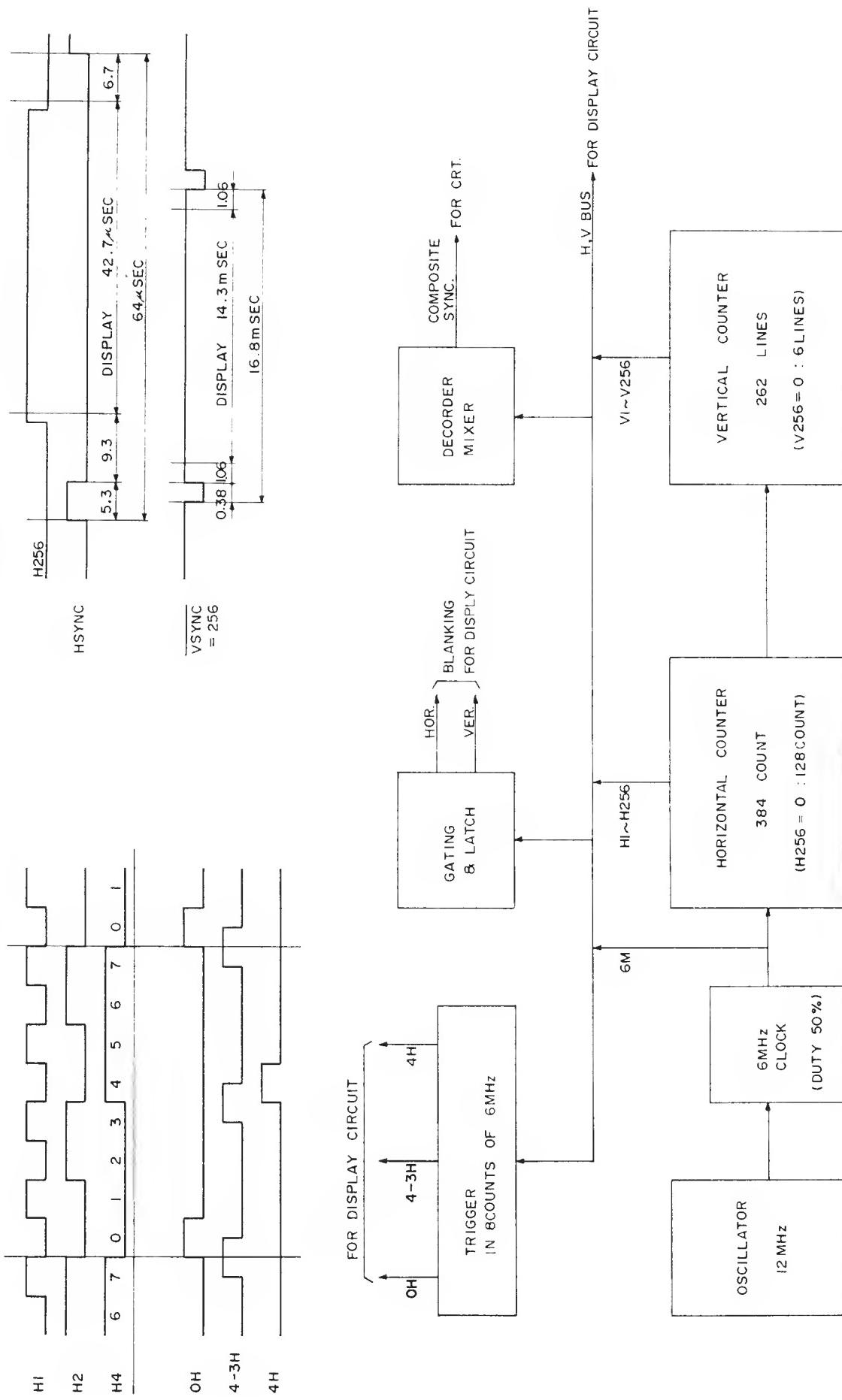
# INPUT/OUTPUT



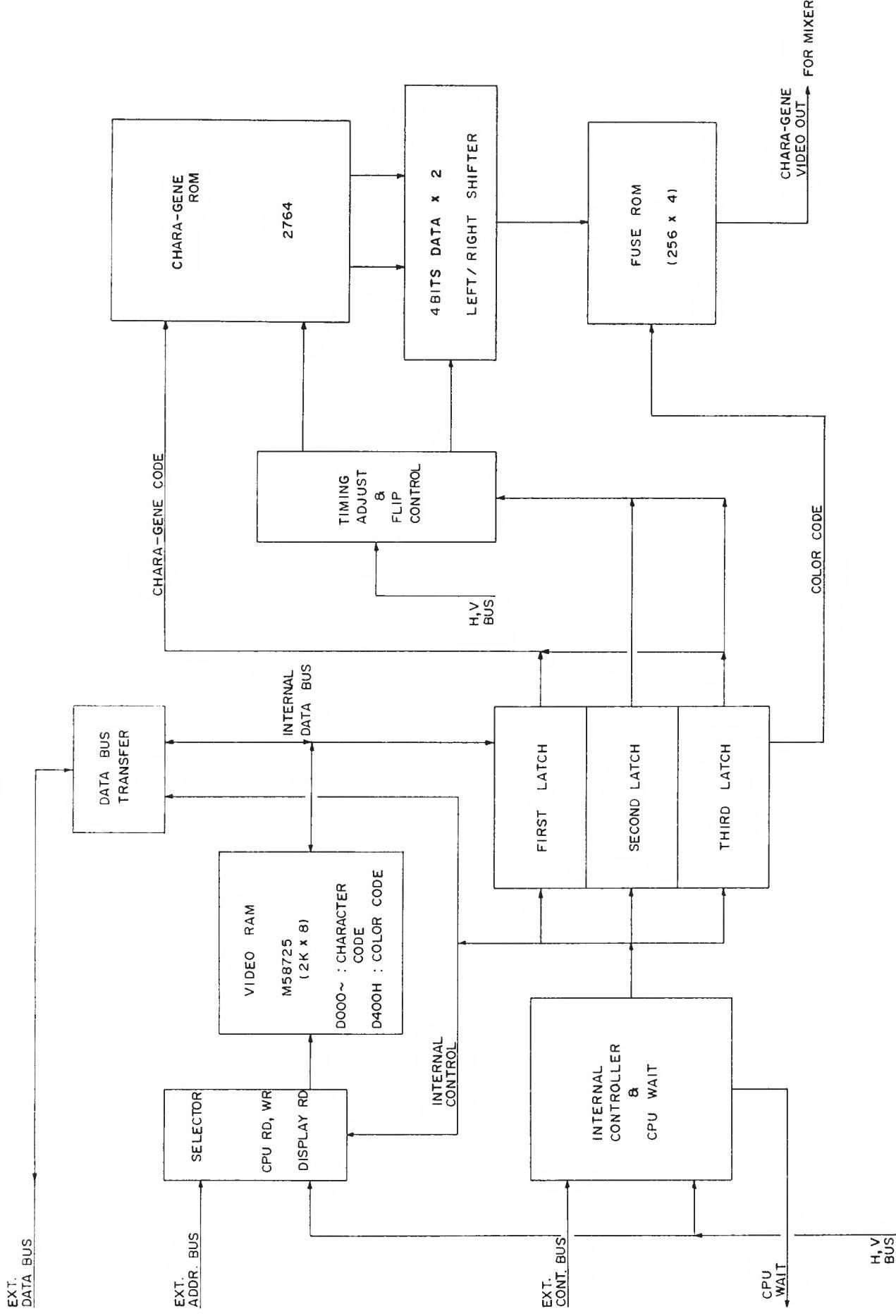
# SOUND



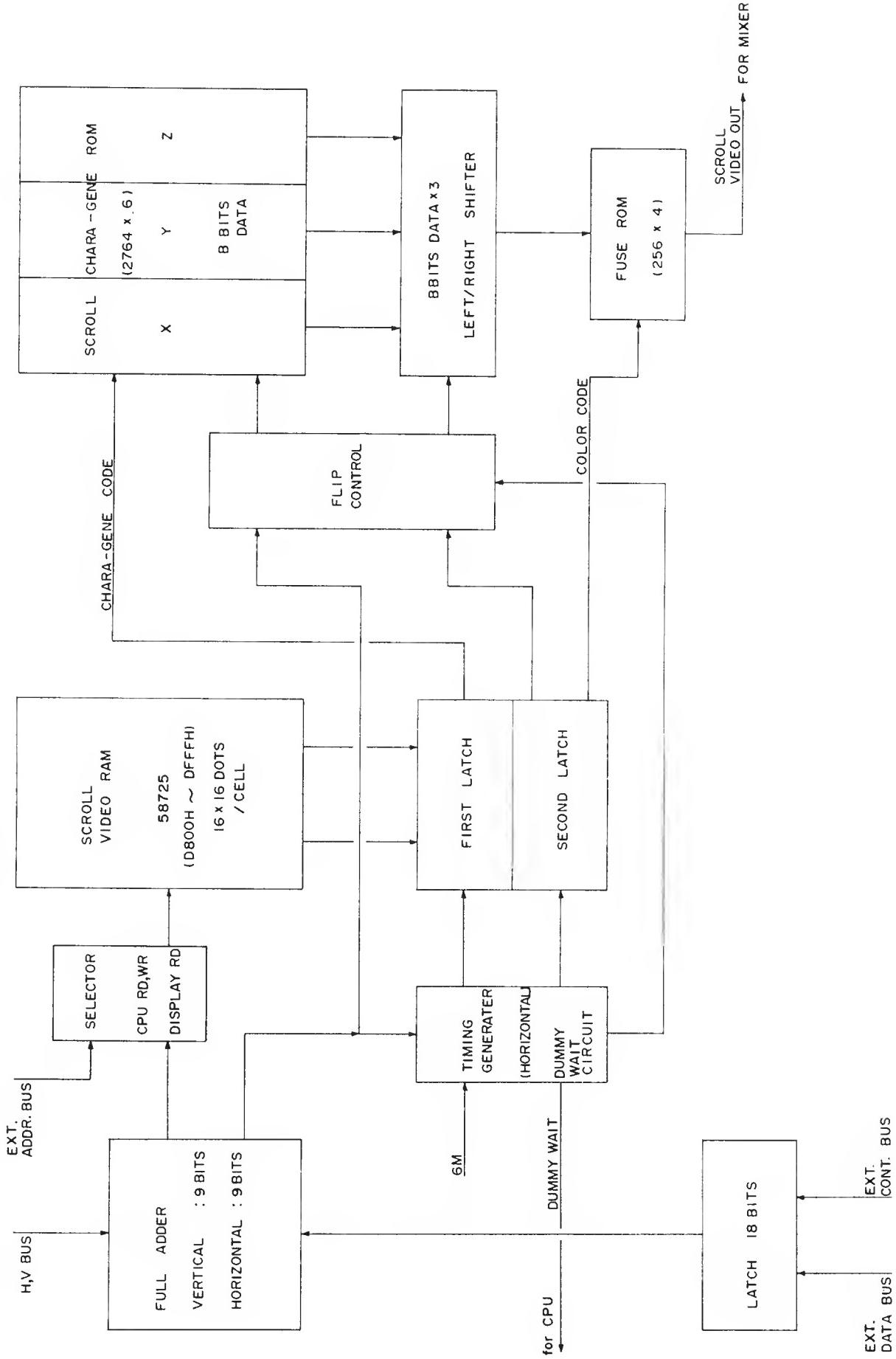
# SYNCHRONOUS SIGNALS



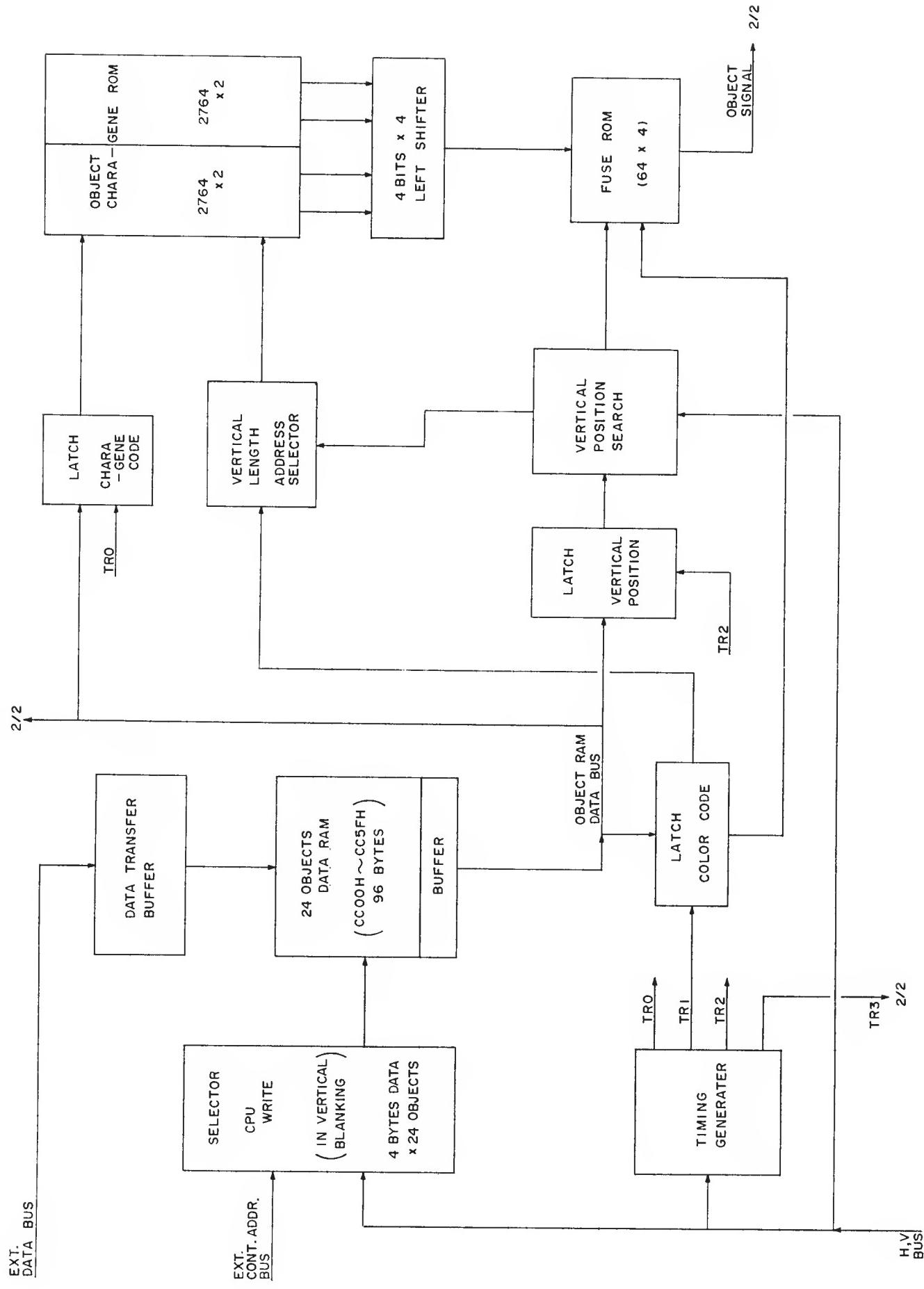
# CHARA-GEN SECTION



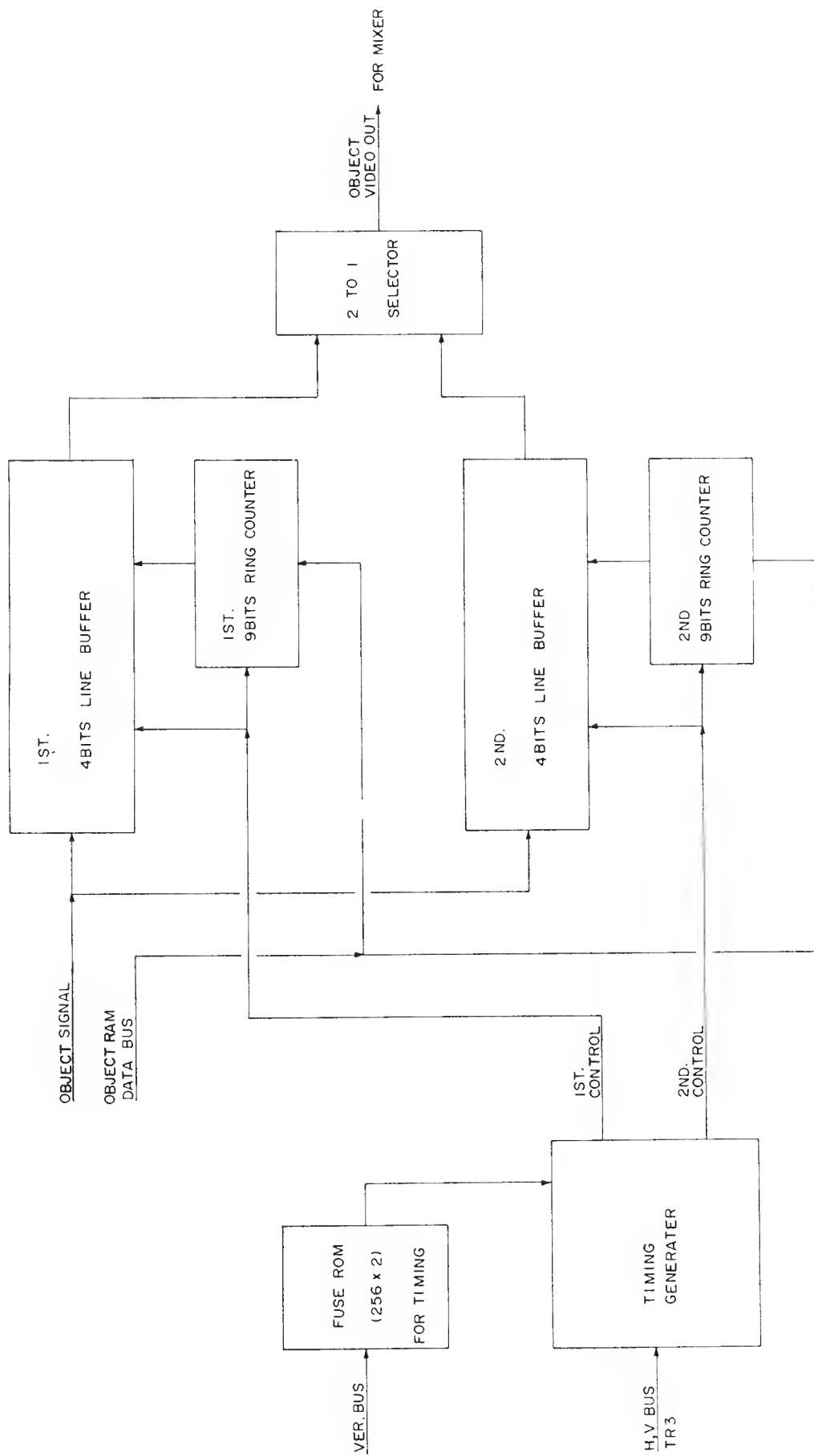
# SCROLL VIDEO SECTION



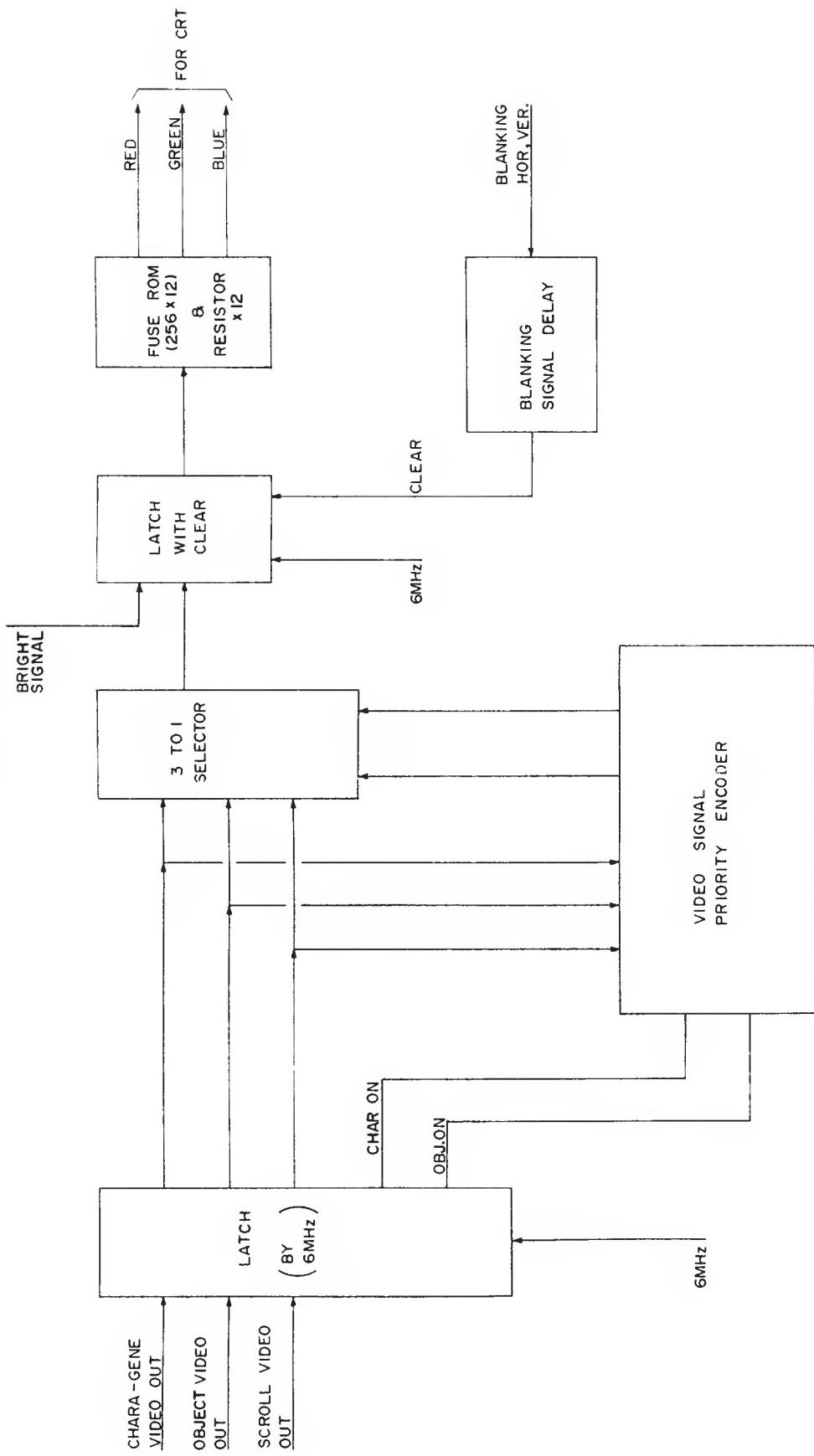
# OBJECT VIDEO SECTION 1/2



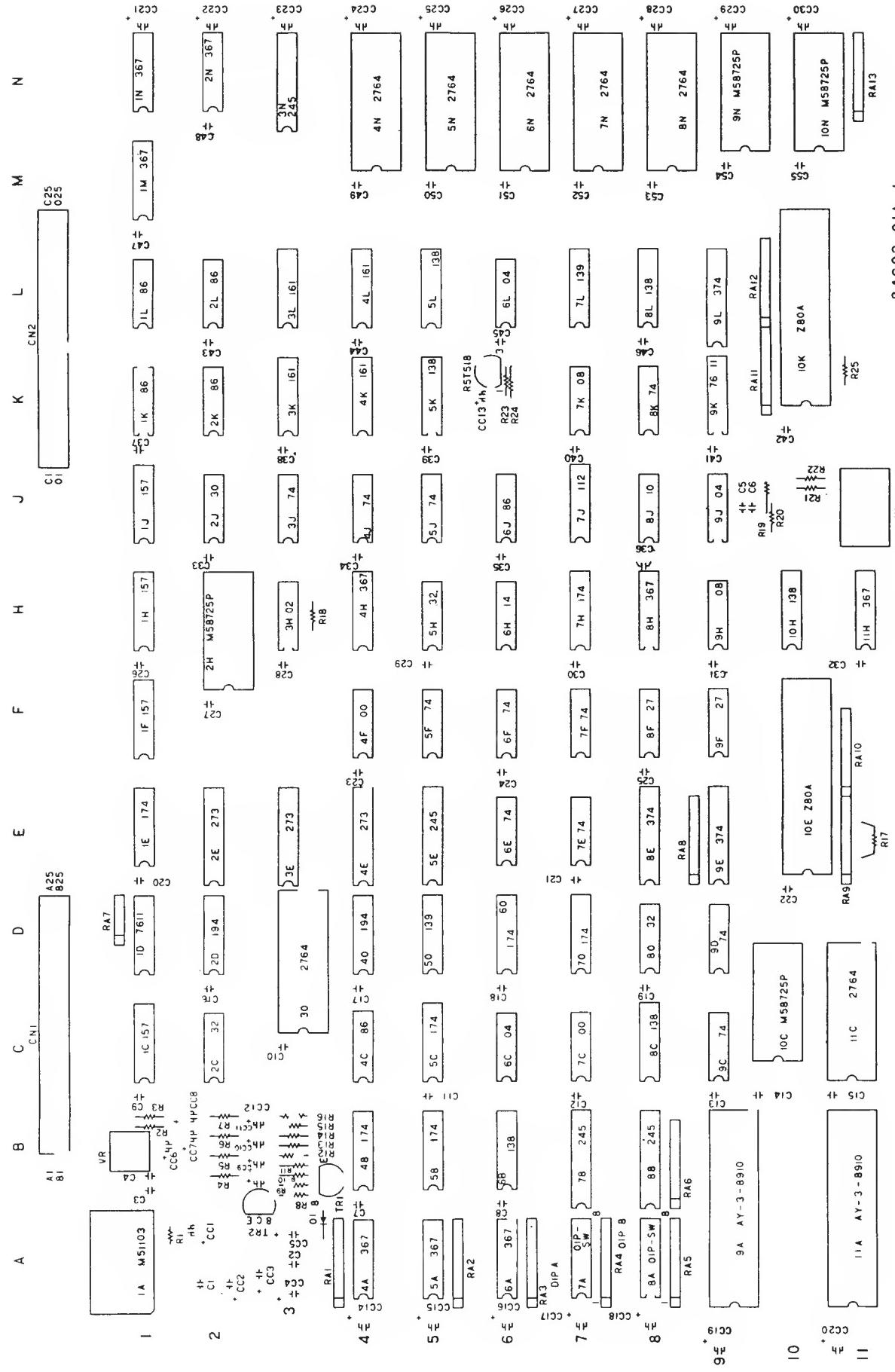
## OBJECT VIDEO SECTION 2/2



# MIXER



# 84602-01A-1



# 84602-02A

